

Notice of Allowability

Application No.

10/529,492

Examiner

Rhonda S. Peace

Applicant(s)

ENOKIDO, YASUSHI

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Applicant's amendment after final rejection, filed 6/16/2006.
2. ☒ The allowed claim(s) is/are 3-16.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


John D. Lee
Primary Examiner

DETAILED ACTION

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

This Examiner's Amendment places appropriate punctuation at the end of claim 15.

The application has been amended as follows:

Claim 15 now reads:

A two-dimensional photonic crystal formed by a periodical two-dimensional arrangement of plural unit lattices, comprising:

a prism-shaped first dielectric area arranged at each lattice point of each unit lattice;

a prism-shaped second dielectric area arranged at an approximate center of each unit lattice; and

a third dielectric area adjacent to and around the first and second dielectric areas, the third dielectric area having a relative dielectric constant different from relative dielectric constants of the first and second dielectric areas,

wherein the first and second dielectric areas are formed by air and the third dielectric area is formed by a dielectric material containing a ceramic material.

Allowable Subject Matter

Claims 3-16 are allowed.

The following is an examiner's statement of reasons for allowance:

- Pertaining to claim 4, the applicable prior art does not disclose, nor does it reasonably suggest a two-dimensional tetragonal-lattice photonic crystal having three dielectric areas, such as a first, second and third dielectric areas, where a cylindrical first dielectric area is arranged at each lattice

point of each lattice unit, a second cylindrical dielectric area is arranged at the approximate center of each lattice unit, and a third dielectric area is arranged adjacent to and around the first and second dielectric areas, where the third dielectric area has a relative dielectric constant differing from the dielectric constants of the first and second areas, and wherein the first and second substantially cylindrical dielectric areas satisfy the following relationship:

$$0.4a \leq r_1 + r_2 \leq 0.6a$$

where a represents a unit length of the lattice axis, r_1 indicated the radius of the first dielectric area, and r_2 represents the radius of the second dielectric area. As claims 5, 7, and 9-14 depend from claim 4, these claims are also considered allowable, due to their inheritance of the limitations of claim 4.

- Concerning claim 8, the applicable prior art does not disclose, nor does it reasonably suggest a two-dimensional photonic crystal having three dielectric areas, such as a first, second and third dielectric areas, where a first prism-shaped dielectric area is arranged at each lattice point of each lattice unit in the crystal, a second prism-shaped dielectric area is arranged at the approximate center of each lattice unit, and a third dielectric area is arranged adjacent to and around the first and second dielectric areas, where the third dielectric area has a relative dielectric constant differing from the dielectric constants of the first and second

areas, and wherein the first, second, and third dielectric areas, having dielectric constants ϵ_1 , ϵ_2 , and ϵ_3 , respectively, satisfy the following relationship:

$$(\epsilon_3 > \epsilon_1), \text{ and } (\epsilon_2/\epsilon_1 > 20)$$

As claims 3, 6, 7, and 10-14 depend from claim 8, these claims are also considered allowable, due to their inheritance of the limitations of claim 8.

- With regard to claim 15, the applicable prior art does not disclose, nor does it reasonably suggest a two-dimensional photonic crystal having three dielectric areas, such as a first, second and third dielectric areas, where a first prism-shaped dielectric area is arranged at each lattice point of each lattice unit in the crystal, a second prism-shaped dielectric area is arranged at the approximate center of each lattice unit, and a third dielectric area is arranged adjacent to and around the first and second dielectric areas, where the third dielectric area has a relative dielectric constant differing from the dielectric constants of the first and second areas, where the first and second dielectric areas are formed by air and the third dielectric area is formed by a dielectric material containing a ceramic material.
- Addressing claim 16, the applicable prior art does not disclose, nor does it reasonably suggest a two-dimensional photonic crystal having three dielectric areas, such as a first, second and third dielectric areas, where a first prism-shaped dielectric area is arranged at each lattice point of each

Art Unit: 2874

lattice unit in the crystal, a second prism-shaped dielectric area is arranged at the approximate center of each lattice unit, and a third dielectric area is arranged adjacent to and around the first and second dielectric areas, where the third dielectric area has a relative dielectric constant differing from the dielectric constants of the first and second areas, where the first and second dielectric areas are formed by a dielectric material containing a ceramic material and the third dielectric area is formed by air.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments, see pages 6-7, filed 6/16/2006, with respect to claims 3-16 have been fully considered and are persuasive. The 35 U.S.C. §102(b) rejection of claims 3, 6, 7, and 12, as well as the 35 U.S.C. §103(a) rejection of claims 5, 13, and 14 have been withdrawn.

Conclusion

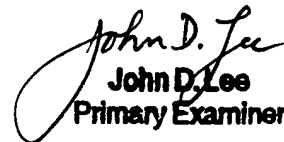
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rhonda S. Peace whose telephone number is (571) 272-8580. The examiner can normally be reached on M-F (8-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272- 2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Rhonda S. Peace
Examiner
Art Unit 2874



John D. Lee
Primary Examiner